CHAPTER TWO

PROFILE OF THE CONSTRUCTION & DEVELOPMENT INDUSTRY

2.1 INTRODUCTION

The C&D industry plays an integral role in the nation's economy, contributing approximately five percent of the Gross Domestic Product (GDP). Establishments in this industry are involved in a wide variety of activities, including land development and subdivision, homebuilding, construction of nonresidential buildings and other structures, heavy construction work (including roadways and bridges). Establishments are also involved in a myriad of special trades, such as plumbing, roofing, electrical, excavation, and demolition work. Some of these activities result in land disturbances that can cause erosion and the transport of soil and sediment in stormwater runoff (U.S. EPA, 2001). EPA's Options 1, 2, and 4 for the C&D industry seek to reduce the environmental and economic effects of stormwater runoff from construction sites (Option 3 is the no-action alternative). See Chapter Three for more information on the options EPA considered. EPA's decision for the Final Action is discussed in the Preamble to that action.

Several characteristics of the C&D industry affect the structure of this economic analysis:

- Individuals (e.g., homebuyers) are often the direct customers of the C&D industry. With individuals as the direct consumer, it is helpful to address issues such as cost passthrough and the impacts of regulations on housing affordability.
- There are complex and varying relationships between developers and builders, resulting in a variety of different business models. Developers may undertake all site improvements and sell completed lots directly to builders, act as builders themselves and remain onsite to build out the development, or some combination of the two.
- The C&D industry is dominated by small businesses. EPA has, therefore, carefully considered the impacts on small businesses in accordance with SBREFA.
- C&D activities are highly localized. This suggests that a regional approach to analysis is helpful in order to account for varying market conditions.

- According to standard definitions, the industry includes a large number of establishments primarily engaged in remodeling activities and special trades (e.g., plumbing, electrical). These establishments are less likely to be involved in land disturbing activities.

The C&D industry, as defined for this rule, is comprised of four main industry groups.

- Land development and subdivision
- Residential construction (including single-family and multifamily construction)
- Nonresidential construction (including commercial and industrial construction)
- Heavy construction

These four industry groups encompass those parts of the industry most likely to engage in land disturbing activities and further affect the structure of this analysis. EPA is concerned with stormwater runoff from construction sites, which carries increased sediment loads (and potentially increased loads of metals and nutrients) into receiving waters, impairing the functioning of those waters (U.S. EPA, 2001).

2.1.1 Recent Trends in the C&D Industry

Table 2-1 presents the number of C&D establishments in 1992, 1997, and 2000. Data for the years 1992 and 1997 are from the Economic Census, whereas 2000 data are from the U.S. Census Bureau's County Business Patterns. The 2002 Economic Census data were not available when this report was published. Between 1992 and 1997, the number of C&D industry establishments with payroll increased 11.0 percent, from 235,789 to 261,617. Between 1997 and 2000, the number of establishments with payroll increased another 8.8 percent to 284,627 (see Table 2-1). This modest increase masks some significant offsetting changes in establishment counts among groups within the industry as defined by the North American Industry Classification System[1] (NAICS):[2]

[1] This profile refers to the 1997 NAICS classification. Construction-related NAICS codes were revised in 2002. As our primary data source, the 1997 Census of Construction, has not been restated in the new classification, so we continue to use the 1997 NAICS system. Appendix 2-A at the end of Chapter Two provides a cross-walk to the 2002 NAICS classification.

[2] The Census Bureau classifies industries according to the NAICS. Under the NAICS, economic activity is first divided into twenty broad two-digit industry codes. One of these is Construction (NAICS 23). Each two-digit industry is further subdivided into threee-, four-, and five-digit level industries.

- The number of establishments in the land development industry group (NAICS 2331) *decreased* by 46.6 percent between 1992 and 1997 and *increased* by 60.2 percent between 1997 and 2000.

- Between 1992 and 1997, there was a 13.5 percent *increase* in the number of establishments in residential and nonresidential construction (NAICS 233, except 2331). The number of establishments *increased* by another 6.4 percent between 1997 and 2000.

- While the number of establishments in heavy construction *increased* by 14.5 percent between 1992 and 1997, the number *decreased* by 7.1 percent from 1997 to 2000.

- There was a 33.0 percent *increase* in the number of special trades contractor establishments (NAICS 235) between 1992 and 1997, including a 31.2 percent increase among excavation contractors and a 59.6 percent increase among demolition contractors. Between 1997 and 2000, the number of establishments engaged in special trades contracting *increased* by another 45.5 percent. During this time period, establishments specializing in excavation contracting increased by 48.1 percent while those in demolition contracting increased by 13.7 percent.

Table 2-1. Number of Establishments in the C&D Industry, 1992 and 1997 Economic Census Data and 2000 County Business Patterns Data

NAICS	Description	1992	1997	2000	Percent Change 1992-1997	Percent Change 1997-2000
233, except 2331[a]	Building, developing, and general contracting, except land development and subdevelopment	168,407	191,101	203,243	13.5%	6.4%
2331	Land development and subdevelopment	15,338	8,185	13,111	-46.6%	60.2%
234	Heavy construction	37,180	42,557	39,516	14.5%	-7.1%
235[b]	Special trade contracting	14,864	19,771	28,757	33.0%	45.5%
TOTAL		**235,789**	**261,617**	**284,627**	**11.0%**	**8.8%**

[a] Includes both residential and nonresidential construction.
[b] Includes NAICS 23593 (Excavation contractors) and 23594 (Wrecking and demolition contractors) only.
Figures do not necessarily add to totals due to rounding.
Source: U.S. Census Bureau (2000), U.S. Census Bureau (2003a).

2.1.2 Data Sources Used

Several data sources are used in this profile chapter to characterize the C&D industry. The primary data source is the 1997 Census of Construction (herein referred to as the census), conducted every five years by the U.S. Census Bureau[3]. A second data source comes from the U.S. Small Business Administration (SBA). The SBA data is used because it provides firm-level data that is useful for economic modeling purposes and for the small entity analysis (the census data is reported at the level of the construction establishment, not the firm). Table 2-2 compares the census data with that from SBA in order to further clarify the differences and identify how each are used in this EA. The majority of this chapter uses data from the 1997 Census to profile the C&D industry, since that source provides a greater level of detail on industry characteristics.

Table 2-2. Comparison of Major Data Sources

Characteristic	Data Source: Census of Construction	Data Source: SBA
Level of Detail	Establishment[a]	Firm[b] (company) and establishment
Source of Data	Survey (sent to approximately 130,000 establishments from a universe of 650,000)	County Business Patterns SUSB report, which ultimately relies on administrative records data
How the Data are Applied in this Analysis	Industry-level analysis to determine the number of potentially affected establishments	Firm-level analysis, for purposes of determining the number of potentially affected firms considered "small" by SBA size standards

[a] The Census Bureau defines an establishment as "a relatively permanent office or other place of business where the usual business activities related to construction are conducted" (U.S. Census Bureau, 2000).
[b] A firm is considered to be an aggregation of the establishments owned by a single company; therefore, one firm could comprise several establishments.

The 2002 Census of Construction was fielded in December 2002. Completed questionnaires were due in February 2003. Many respondents requested and received extensions of the filing deadline. With data entry, follow-up, consistency checks, and summarization, results are not expected to be released until 2004 and 2005. The new census will provide improved data for analyses such as this one. It will be based on the 2002 NAICS classification, which distinguishes builders of new construction from remodelers and offers more detailed classification of building trades. A special section was added to the census to explore joint venture relationships, which commenters on the proposed rule have cited as a

[3] The 2002 Census is not available.

significant form of business organization. The 2002 Census data, unfortunately, are not available for this analysis.

2.1.3 Organization of this Chapter

The purpose of this profile is to provide an overview of the C&D industry, describe its key characteristics and structure, and analyze current and historical trends. Section 2.2 describes the process that EPA used to identify and define the industry for the purposes of the proposed rule and Final Action. Section 2.3 presents characteristics of the C&D industry, including both industry and firm-level data. Section 2.4 covers industry growth and trends, and Section 2.5 briefly examines international competition in the C&D industry. Detailed discussions on market supply and demand factors in the C&D industry, economic and financial characteristics of the industry, and key business indicators and ratios can be found in the Economic Analysis of the proposed rule (U.S. EPA, 2002).

2.2 INDUSTRY DEFINITION

2.2.1 Basis for Regulation

The Final Action will potentially affect establishments within the construction sector (NAICS 23) that disturb the land at construction sites of 1 acre or more or 5 acres or more, depending on the option selected for the Final Action. These land-disturbing activities can include site preparation and site clearing tasks, such as tree removal, excavation, blasting, scraping, and grading, and are generally accomplished with the aid of heavy equipment, such as skidders, bulldozers, backhoes, excavators, and graders. These activities can destabilize soils and create conditions that allow stormwater to accumulate and flow across the site. This increase in stormwater flow can cause erosion and lead to the transport of soil particles and attached pollutants, which eventually can be conveyed offsite and discharged into receiving waters. Both the increased flow and associated pollutant and sediment loads that result from land-disturbing activities can negatively impact the biological, physical, and chemical characteristics of the receiving waters.

Options 1, 2, and 4 build on the Phase I and Phase II stormwater regulations promulgated under the National Pollutant Discharge Elimination System (NPDES), as well as on EPA's stormwater construction general permit (CGP). The CGP is the vehicle through which Phase I and Phase II regulations are being implemented. Where EPA is the permitting authority. See Chapter One for more details on the CGP. As with the proposed rule, Options 1, 2 and 4 also build on current state and local stormwater control requirements by adding increased specificity and consistency to them. See Chapter Three for more information on the options EPA considered. The methodology chapter (Chapter Four) provides further detail on how the options are designed to be implemented.

2.2.2 Industry Definition

For the purposes of this economic analysis, the "C&D industry" is assumed to include those establishments within the construction sector (NAICS 23) that could be involved in activities that disturb the ground at construction sites. This includes site clearing or site preparation activities, such as tree removal, excavation, blasting, scraping, grading, etc. EPA believes that many establishments in NAICS 233 (building, developing, and general contracting) and NAICS 234 (heavy construction) are likely to engage in such activities on a regular basis. Establishments within selected five-digit industries that are part of NAICS 235 (special trade contractors) could also engage in land-disturbing activities. The latter could include NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors). The remainder of the special trades industry is considered unlikely to engage in such activities.
Table 2-3 identifies the industry groups that could be covered by the Final Action.

As seen in Table 2-3, each NAICS industry is comprised of one or more industry groups defined under the former Standard Industrial Classification (SIC) system. With the 1997 Census, the Census Bureau switched from reporting data on a SIC basis to a NAICS basis, thereby making it difficult to compare data from 1997 with that from the 1992 and earlier census reporting periods. Within this economic profile, the objective is to provide data at the most detailed level as possible, while still maintaining the ability to provide meaningful comparisons between 1997 and earlier census periods. With this goal in mind, EPA made further adjustments to the groups of affected industry groups later in this chapter and in Chapter Four to correspond to assessments of the likelihood that the industry groups will disturb land or that they will disturb only small sites and, thus, meet the site size exclusions reflected

Table 2-3. Industry Definitions for C&D Industry Profile

1997 NAICS Code	Description	Relevant SIC Codes [a]
233	**Building, developing, and general contracting**	
2331	Land subdivision and development	
23311	Land subdivision and development	6552 Land subdividers and developers, except cemeteries
2332	Residential building construction	
23321	Single-family housing construction	1521 General contractors–single-family houses 1531 Operative builders (partial) 8741 Management services (partial)
23322	Multifamily housing construction	1522 General contractors–residential buildings other than single-family (partial) 1531 Operative builders (partial) 8741 Management services (partial)
2333	Nonresidential building construction	
23331	Manufacturing and industrial building construction	1531 Operative builders (partial) 1541 General contractors–industrial buildings and warehouses (partial) 8741 Management services (partial)
23332	Commercial and institutional building construction	1522 General contractors–residential buildings, other than single-family (partial) 1531 Operative builders (partial) 1541 General contractors–industrial buildings and warehouses (partial) 1542 General contractors–nonresidential buildings except industrial buildings and warehouses 8741 Management services (partial)
234	**Heavy Construction**	
2341	Highway, street, bridge, and tunnel construction	
23411	Highway and street construction	1611 Highway and street construction contractors, except elevated highways 8741 Management services (partial)
23412	Bridge and tunnel construction	1622 Bridge, tunnel, and elevated highway construction
2349	Other heavy construction	
23491	Water, sewer, and pipeline construction	1623 Water, sewer, pipeline, and communications and power line construction (partial) 8741 Management services (partial)
23492	Power and communication transmission line construction	1623 Water, sewer, pipeline, and communications and power line construction (partial) 8741 Management services (partial)
23493	Industrial nonbuilding structure construction	1629 Heavy construction, n.e.c. (partial) 8741 Management services (partial)
23499	All other heavy construction	1629 Heavy construction, n.e.c. (partial) 7353 Heavy construction equipment rental and leasing (partial) 8741 Management services (partial)
235	**Special trade contractors**	
23593	Excavation contractors	1794 Excavation work special trade contractors
23594	Wrecking and demolition contractors	1795 Wrecking and demolition work special trade contractors

[a] NAICS replaced the SIC (Standard Industrial Classification) System.
Source: U.S. Census Bureau (2000).

in the regulatory options. The statistical tables contained in this profile reflect these adjustments.[4] Certain categories are also excluded later in this EA based on qualitative assessments that they are unlikely to bear the ultimate impact of the regulatory options.

The NAICS covered in this EA include:

- NAICS 233, except 2331—Building, developing, and general contracting, except land subdivision and land development
- NAICS 2331—Land subdivision and land development
- NAICS 234—Heavy construction (when possible, covered industries are only to include NAICS 23593 [excavation contractors] and NAICS 23594 [wrecking and demolition contractors].)
- NAICS 235—Special trades contractors

2.3 INDUSTRY CHARACTERISTICS

As in the proposed rule, several steps are used to define the number of C&D establishments that could be affected by the options EPA considered. First, EPA identifies all C&D establishments, as defined above, using data from the 1997 Census of Construction (see Table 2-1). Second, EPA estimates the number of establishments classified as C&D establishments that are primarily engaged in remodeling work, using data from the National Association of Home Builders (NAHB) and the Joint Center for Housing Studies at Harvard University (Joint Center). Third, EPA estimates the number of establishments classified as C&D establishments that are engaged in C&D activities, but unlikely to disturb 1 or more acres of land or 5 or more acres of land, using data from the Census Bureau and various secondary sources. Section 2.3.1 examines the industrywide characteristics, including the number and size of establishments, employment, and geographic distribution of establishments. Section 2.3.2

[4] Some detailed breakdowns are available only at the three-digit NAICS level. Separate data for NAICS 2331 cannot be provided and will be included with data for all of NAICS 233. NAICS 233, except 2331, includes data for both residential and nonresidential construction activities. Where more detailed data are available, they are included in this profile. In some cases, data at a more detailed NAICS level are available (e.g., five-digit NAICS) but are too detailed to present in the body of this profile. The availability of such data is noted throughout the profile, and reference is made to Appendix 2A in the Economic Analysis of the proposed rule, where tables present this data (U.S. EPA, 2002).

describes firm-level data for the C&D industry. Section 2.3.3 presents the number of small entities, and Section 2.3.4 examines the number of entities that disturb less than 1 acre during the normal course of business. The estimated number of in scope and potentially affected establishments is presented in Section 2.3.5.

2.3.1 Establishment-Level Data

This section presents data for all establishments within the C&D industry as defined in Section 2.2, based primarily on 1997 Census of Construction sources. It includes information on the number and size, geographic distribution, employment, payroll and benefits, and level of specialization of establishments.

2.3.1.1 Number and Size of Establishments

Data from the Census of Construction indicate that there were a total of 261,617 establishments with payrolls in the C&D industry in 1997 (i.e., NAICS 233, 234, 23593, and 23594; see Tables 2-1 and 2-4). Of these establishments, the largest number are in NAICS 233 (building, developing, and general contracting). This subsector includes 199,289 establishments, representing 76.2 percent of all C&D establishments. Within NAICS 233, single-family home construction (NAICS 23321) accounted for the majority of establishments (138,849 out of 199,289 or 69.7 percent).

Land development and subdevelopment (NAICS 2331) accounted for 8,185 establishments or 3.1 percent of all establishments in the C&D industry. NAICS 234 (heavy construction) includes 42,557 establishments or 16.3 percent of the total. Of these establishments, 27 percent are primarily highway and street construction contractors, while 27 percent are contractors that work on water, sewer, pipeline, communications, and power line projects and 43 percent are engaged in other types of heavy construction (all other heavy construction). Within the special trades contractors subsector (NAICS 235), NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) account for 19,771 establishments, or 7.6 percent of the C&D industry total. Excavation contractors account for more than 90 percent of these establishments.

Table 2-4. Number of Establishments in the C&D Industry, Based on the 1997 Census of Construction

NAICS	Description	Establishments With Payrolls	
		Number	Percent of Total
233	Building, developing, and general contracting	199,289	76.2%
2331	Land development and subdivision	8,185	3.1%
23321	Single-family residential building construction	138,849	53.1%
23322	Multi-family residential building construction	7,543	2.9%
2333	Nonresidential construction	44,710	17.1%
234	Heavy construction	42,557	16.3%
235[a]	Special trade contracting	19,771	7.6%
SUBTOTAL		**261,617**	**100.0%**

[a] Covered industry groups include NAICS 23593 (excavation contractors) and NAICS 23594 (wrecking and demolition contractors) only.

Across the board, C&D industry groups are dominated by small establishments.[5] As shown in Table 2-5, the Census Bureau reports that 60.6 percent of establishments with payrolls have fewer than 5 employees, 77.8 percent have fewer than 10 employees, and 87.1 percent have fewer than 20 employees.[6] Overall, only 1.1 percent of C&D establishments with payrolls have 100 or more employees. On average, establishments in NAICS 234 (heavy construction) are somewhat larger than those in the other NAICS industry groups, with a lower percentage of establishments appearing in each of the smaller establishment size classes.

[5] The SBA uses size standards based on either the number of employees or annual revenue (13 CFR 121) to classify establishments as "small". Qualifying revenue levels differ among NAICS industry groups, and, within the C&D industries, there is a range of qualifying revenue levels, from $5.0 million for NAICS 23311 (land subdivision and development) to $27.5 million for the majority of industry groups within NAICS 233 and 234. Under the new 2002 NAICS structure, size standards for construction firms have been updated to $6.0 million for NAICS 23311 (land subdivision and development) and $28.5 million for the majority of industry groups within NAICS 233 and 234 (U.S. SBA, 2002). A more detailed review of industry size distribution based on the SBA definitions will be presented as part of the Small Entity Impact Analysis.

[6] As noted above, 450,338 establishments in the C&D industry have *no* employees.

The preponderance of small establishments is equally apparent when analyzed on the basis of revenue size class. In 1997, 37.1 percent of establishments with payrolls had annual revenues below $250,000, 54.7 percent had annual revenues below $500,000, and 69.6 percent had annual revenues below $1.0 million. These data are shown in Table 2-6. Only 9,118 establishments, representing 3.5 percent of the total, had annual revenues in excess of $10.0 million. The small business analysis is presented in Chapter 6 of this EA.

In addition to the small establishments with payrolls, a large number of establishments— 450,338 in 1997[7]—operate with no paid employees and are not included in the totals in Tables 2-4 through 2-6. Available data suggest these establishments are very small relative to establishments with payrolls. While employer establishments in NAICS 233 and 234 had $517.7 billion in receipts for 1997, nonemployer establishments had only $36.5 billion in receipts, which represents only 7 percent of the receipts of employer establishments.

Table 2-5. Number of Small Establishments with Payrolls in the C&D Industry, Based on Employment

NAICS	Description	Total	Establishments with less than 5 employees		Establishments with less than 10 employees		Establishments with less than 20 employees	
			No.	Percent of Total	No.	Percent of Total	No.	Percent of Total
233[a]	Building, developing, and general contracting	199,289	138,926	69.7%	172,079	86.3%	187,672	94.2%
234	Heavy construction	42,557	18,956	44.5%	26,802	63.0%	33,337	78.3%
235[b]	Special trade contractors	19,771	700[c]	3.5%	4,690	23.7%	6,833	34.6%
TOTAL		**261,617**	**158,582**	**60.6%**	**203,571**	**77.8%**	**227,842**	**87.1%**

[a] Data below the three-digit NAICS (i.e., for NAICS 2331 Land development and subdevelopment) are not publishable.
[b] Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
[c] Data for NAICS 23593 (excavation contractors) are not included in this calculation because data did not meet publication standards.
Figures do not necessarily add to totals due to rounding.
Source: U.S. Census Bureau (2000).

[7] This figure only includes establishments in NAICS 233 and 234. Data on nonemployer establishments were not available at the five-digit NAICS level for NAICS 235. Thus information for NAICS 23593 and 23594 could not be separated from the rest of NAICS 2359 (other special trade contractors). Including all nonemployer establishments in NAICS 2359 (339,521), the total number of such establishments in the C&D industry is 789,859.

Table 2-6. Number of Small Establishments in the C&D Industry, Based on Value of Business Done

NAICS	Description	Total	Establishments with less than $250,000 in business		Establishments with less than $500,000 in business		Establishments with less than $1 million in business	
			No.	Percent of Total	No.	Percent of Total	No.	Percent of Total
233[a]	Building, developing, and general contracting	199,289	83,536	41.9%	118,493	59.5%	147,917	74.2%
234	Heavy construction	42,557	13,364	31.4%	20,238	47.6%	26,726	62.8%
235[b,c]	Special trade contractors	19,771	269	1.4%	4,344	22.0%	7,385	37.4%
TOTAL		**261,617**	**97,169**	**37.1%**	**143,075**	**54.7%**	**182,028**	**69.6%**

[a] Data below the three-digit NAICS (i.e., for NAICS 2331 Land development and subdevelopment) are not publishable.
[b] Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
[c] Figures could be low due to lack of sufficient data for NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) for values under $250,000.
Figures do not necessarily add to totals due to rounding.
Source: U.S. Census Bureau (2000).

The average level of receipts among nonemployer establishments is $81,000 versus $1.98 million for establishments with payrolls. A recent study by the Joint Center indicates that a substantial number of the nonemployer establishments—at least 141,000 of those classified as general building contractors (NAICS 233)—are actually remodelers (Joint Center, 2001).[8] The Joint Center estimates do not account for nonemployer establishments outside NAICS 233 (i.e., NAICS 234 [heavy construction] or 235 [special trades]).

2.3.1.2 Legal Form of Organization

The Census Bureau defines construction establishments according to how they are organized legally, using the following classification scheme: (a) corporations, (b) proprietorships, (c) partnerships, and (d) other. In 1997, a total of 173,602 C&D establishments with payrolls (66.4 percent of the total) were organized as corporations (see Table 2-7). A further 64,733 (24.7 percent) were organized as

[8] The estimate of 141,000 establishments may be an underestimate. The Joint Center applied the percentage of establishments with payrolls known to be remodelers to the nonemployer establishments. In practice, remodelers probably account for a larger percentage of nonemployer establishments than employer establishments. As the report states, "our procedures thus generate a conservative estimate of the number of businesses concentrating their activities in residential remodeling" (Joint Center, 2001, p. 35).

Table 2-7. Number of Establishments in the C&D Industry with Payrolls, by Legal Form of Organization

NAICS	Description	Corporations		Proprietorships		Partnerships		Other		Total	
		Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
233	Building, developing, and general contracting, except land subdivision and development (2331)	124,475	65.1%	50,235	26.3%	9,827	5.1%	6,567	3.4%	191,104	100.0%
2331	Land subdivision and development	6,268	76.6%	327	4.0%	1,323	16.2%	267	3.3%	8,185	100.0%
234	Heavy construction	30,682	72.1%	8,401	19.7%	2,115	5.0%	1,359	3.2%	42,557	100.0%
235[a]	Special trade contractors	12,177	61.6%	5,770	29.2%	1,048	5.3%	776	3.9%	19,771	100.0%
TOTAL		**173,602**	**66.4%**	**64,733**	**24.7%**	**14,313**	**5.5%**	**8,969**	**3.5%**	**261,617**	**100.0%**

[a] Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
Source: U.S. Census Bureau (2000).

proprietorships, while 14,313 (5.5 percent) operated as partnerships and 8,969 (3.5 percent) operated under some other legal form of organization. Organization as a corporation is most prevalent in NAICS 2331 (land subdivision and development), at 76.6 percent, and least prevalent in NAICS 235 (special trade contractors), at 61.6 percent. See Appendix 2A in the Economic Analysis of the proposed rule for more detailed industry-level data (U.S. EPA, 2002).

2.3.1.3 Geographic Distribution

Figure 2-1 shows a geographic distribution of establishments by state. The largest concentrations of establishments are in California, New York, Texas, Florida, and Pennsylvania. Combined, these states account for approximately 25 percent of C&D establishments in the United States.

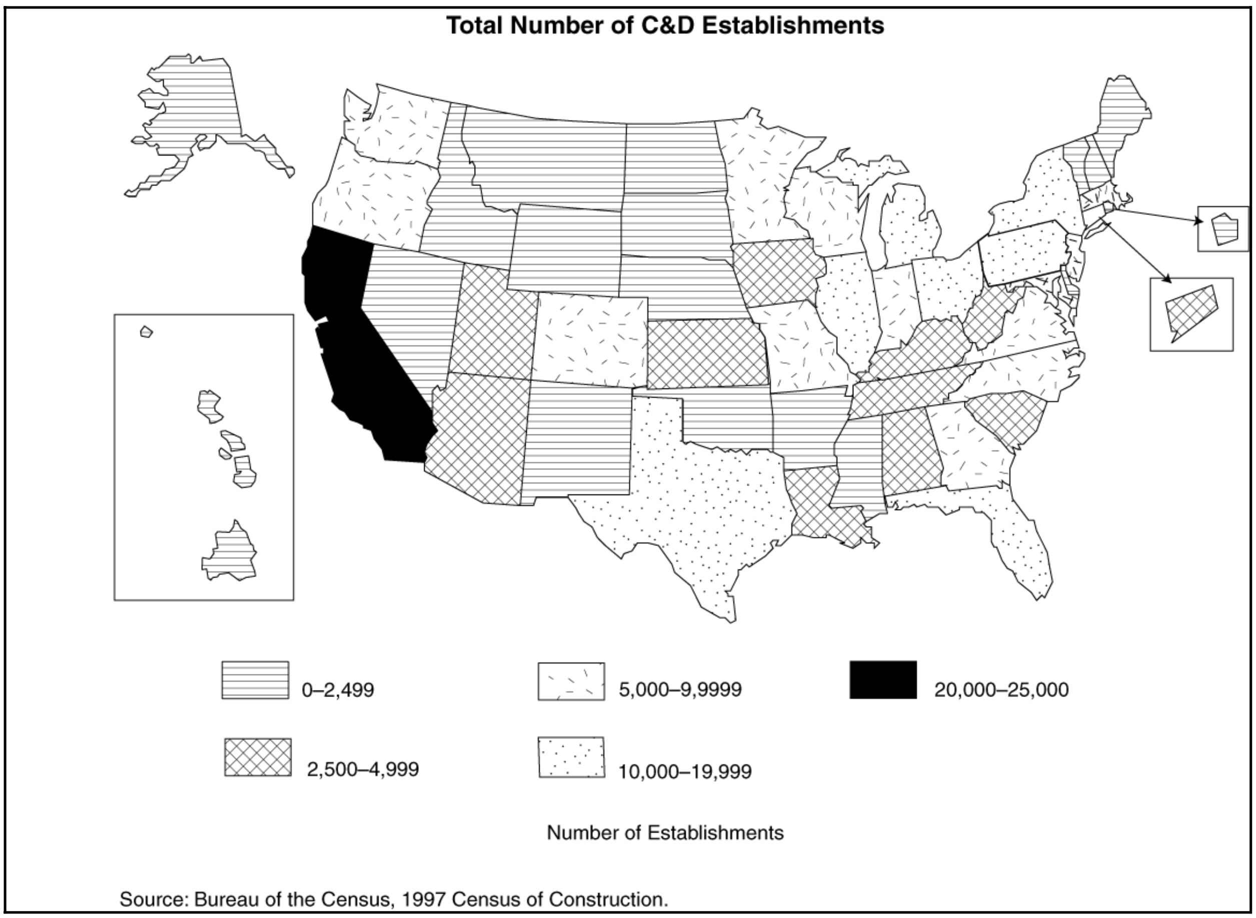


Figure 2-1. Number of Establishments in the C&D Industry, by State, in 1997.

Some commenters said that it was possible that EPA underestimated the number of establishments affected by the options and, therefore, understated costs of the options. EPA believes the estimates are reasonable; the estimates do not affect national costs, which are calculated using the total number of disturbed acres (see Chapter Four).

2.3.1.4 Employment

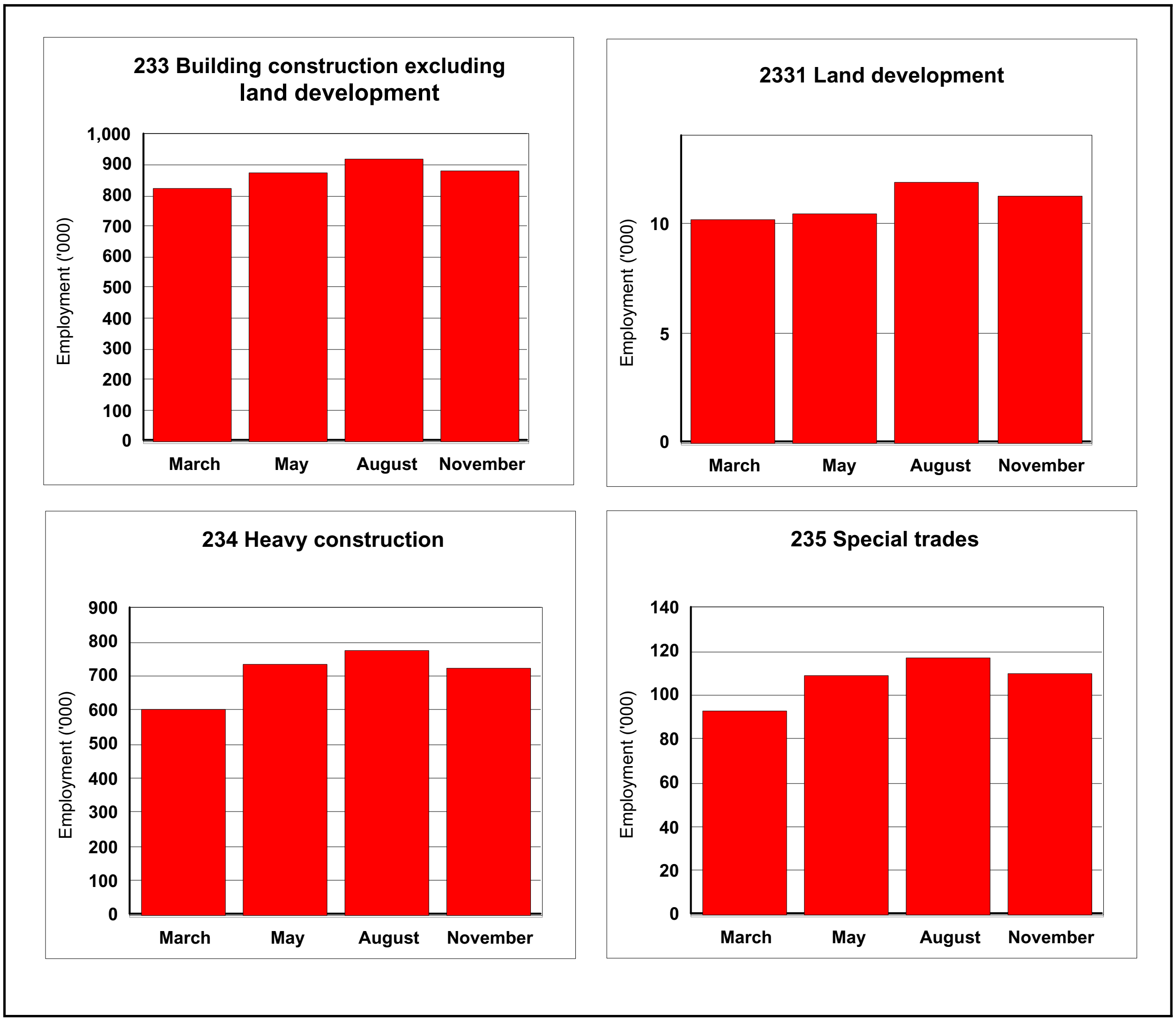
In 1997, establishments with payrolls in the C&D industry employed a total of nearly 2.4 million people. Table 2-8 shows a distribution of employment by NAICS industry group. NAICS 2331 (land subdivision and land development) accounts for 41,827 employees (1.8 percent of the total), while the rest of NAICS 233 (building, developing, and general contracting) accounts for 1.3 million employees, or 55.2 percent of the total. NAICS 234 (heavy construction), employs 880,400 people (37.3 percent of the total), and NAICS 23593 and 23594 (excavation contractors and wrecking/demolition contractors) employ 135,057 people (5.7 percent of the total).

Table 2-8. Number of Employees in the C&D Industry, Establishments With Payrolls, in 1997

NAICS	Description	Number of Employees	Percent of Total
233, except 2331	Building, developing, and general contracting, except land subdivision and land development	1,301,126	55.2%
2331	Land subdivision and land development	41,827	1.8%
234	Heavy construction	880,400	37.3%
235[a]	Special trade contractors	135,057	5.7%
TOTAL		**2,358,410**	**100.0%**

[a] Only includes NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
Source: U.S. Census Bureau (2000).

Construction is a seasonal activity in many parts of the country, and employment data from the industry reflect this fact. Figure 2-2 shows quarterly employment data for all NAICS groups in the C&D industry. It also displays the annual average. Employment of construction workers was lowest in March, at 1.59 million, and highest in August at 1.83 million.



Source: U.S. Census Bureau (2000)

Figure 2-2. Seasonal Trends in Employment in the C&D Industry, 1997.

2.3.1.5 Payrolls and Benefits

In 1997, the payrolls of all C&D industry groups totaled $76.8 billion (see Table 2-9). Of this number, $48.3 billion (62.9 percent) went to construction workers and $28.5 billion (37.1 percent) went to other employees.[9] In addition, the C&D industry incurred $11.2 billion in legally required fringe benefit expenditures and $6.5 billion in voluntary fringe benefits expenditures, for a total of $17.6 billion in fringe benefits.[10] Table 2-9 shows detailed data on payrolls and benefits for each of the C&D industry groups.

2.3.1.6 Specialization

Specialization in the C&D industry refers to the percentage of establishment revenues earned from different types of construction activity. Specialization data provide insight into the homogeneity of businesses classified within the same NAICS industry group. Each establishment reports its degree of specialization to the Census Bureau, based on the percentage of revenue earned from each type of construction work. Some establishments in NAICS 23321, for example, are specialized, (i.e., earn 51 percent or more of revenues in either detached single-family housing construction or attached single-family housing construction).[11] Establishments that are 100 percent specialized in detached, single-family housing construction performed construction work worth $90.4 billion, or 64.4 percent of all work done by establishments with specialization in construction work. Similarly, 52.8 percent of the work ($6.6 billion) was done by establishments with complete specialization in attached single-family houses. Further analysis of the specialization and value of construction work performed by the C&D industry groups can be found in the Economic Assessment for the proposed rule (U.S. EPA, 2002).

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[9] *Construction workers* include all workers, through the working supervisor level, directly engaged in construction operations, such as painters, carpenters, plumbers, and electricians. Included are journeymen, mechanics, apprentices, laborers, truck drivers and helpers, equipment operators, and onsite recordkeepers and security guards. *Other employees* include employees in executive, purchasing, accounting, personnel, professional, technical and routine office functions.

[10] *Legally required contributions* include Social Security contributions, unemployment compensation, workman's compensation, and state temporary disability payments. *Voluntary expenditures* include life insurance premiums, pension plans, insurance premiums on hospital and medical plans, welfare plans, and union negotiated benefits.

[11] Although some of them earn revenues from other types of construction (e.g., highway construction) they are no longer be classified in NAICS 23321 if they earn 51 percent or more of their revenue from such sources.

Table 2-9. Payrolls and Benefits for Employees in the C&D (Thousands of 1997 Dollars)

NAICS	Description	Payrolls[a]			Fringe Benefits (All Employees)		
		Construction Worker[b]	Other Employees[c]	All Employees[d]	Legally Required Expenditures[e]	Voluntary Expenditures[f]	Total Fringe Benefits[g]
233	*Building, developing, and general contracting*	*$23,135,832*	*$19,410,280*	*$42,546,112*	*$5,929,710*	*$3,011,115*	*$8,940,824*
23311	Land subdivision and land development	$254,247	$1,255,526	$1,509,773	$164,669	$71,648	$236,317
23321	Single-family housing construction	$7,739,858	$7,224,726	$14,964,583	$2,000,118	$623,079	$2,623,197
23322	Multifamily housing construction	$1,022,265	$744,361	$1,766,627	$255,879	$76,644	$332,523
23331	Manufacturing and industrial building construction	$3,322,347	$1,806,620	$5,128,967	$777,829	$446,522	$1,224,351
23332	Commercial and institutional building construction	$10,797,116	$8,379,046	$19,176,160	$2,731,214	$1,793,222	$4,524,436
234	*Heavy construction*	*$22,218,582*	*$8,073,267*	*$30,291,850*	*$4,665,757*	*$3,120,979*	*$7,786,736*
23411	Highway and street construction	$7,095,139	$2,432,488	$9,527,626	$1,507,465	$1,109,177	$2,616,641
23412	Bridge and tunnel construction	$1,378,759	$468,401	$1,847,160	$344,821	$263,297	$608,117
23491	Water, sewer, and pipeline construction	$4,087,007	$1,435,273	$5,522,281	$844,394	$493,761	$1,338,155
23492	Power and communication transmission line construction	$1,748,715	$638,717	$2,387,432	$374,145	$231,538	$605,683
23493	Industrial nonbuilding structure construction	$2,734,020	$988,343	$3,722,363	$486,625	$302,813	$789,439
23499	All other heavy construction	$5,174,943	$2,110,046	$7,284,989	$1,108,307	$720,394	$1,828,701
235[h]	*Special trade contractors*	*$2,940,440*	*$1,005,609*	*$3,946,050*	*$582,157*	*$329,925*	*$912,082*
23593	Excavation contractors	$2,525,857	$828,017	$3,353,874	$483,764	$283,952	$767,716
23594	Wrecking and demolition contractors	$414,583	$177,592	$592,176	$98,393	$45,973	$144,366
TOTAL		**$48,294,854**	**$28,489,156**	**$76,784,012**	**$11,177,624**	**$6,462,019**	**$17,639,642**

[a] The payroll figures include the gross earnings paid in the calendar year 1997 to all employees on the payrolls of construction establishments. They include all forms of compensation, such as salaries, wages, commissions, bonuses, vacation allowances, sick leave pay, prior to such deductions as employees' Social Security contribution, withholding taxes, group insurance, union dues, and savings bonds.
[b] Construction workers include all workers, through the working supervisor level, directly engaged in construction operations, such as painters, carpenters, plumbers, and electricians. Included are journeymen, mechanics, apprentices, laborers, truck drivers and helpers, equipment operators, and onsite recordkeepers and security guards.
[c] Other employees include employees in executive, purchasing, accounting, personnel, professional, technical and routine office functions.
[d] Sum of construction workers and other employees.
[e] Legally required contributions include Social Security contributions, unemployment compensation, workman's compensation, and state temporary disability payments.
[f] Voluntary expenditures include life insurance premiums, pension plans, insurance premiums on hospital and medical plans, welfare plans, and union negotiated benefits.
[g] Total fringe benefits represent the expenditures made by the employer during 1997 for both legally required and voluntary fringe benefit programs for employees.
[h] Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
Source: U.S. Census Bureau (2000).

2.3.2 Firm-Level Data

The SBA Office of Advocacy contracts with the U.S. Census Bureau to produce firm-level data for U.S. industries. Currently, distributions by employment size are available on a NAICS basis for 2000 and distributions by receipt size are available on a SIC basis for 1997.

The SBA data is based primarily on administrative records and is not generated in conjunction with, or linked to, data collected through the Census of Construction. As a result, there could be minor inconsistences between data reported by SBA and those reported by the Census of Construction.[12] The SBA/Census of Construction data, however, are the *only* firm-level data available for C&D industry groups, so EPA is including than in this analysis. These data are valuable to the economic modeling and the small entity analysis, which applies at the firm, not the establishment, level.[13]

2.3.2.1 Number and Size of Firms (SBA Data)

Table 2-10 presents the number of firms with payrolls (firms with paid employment) and the number of establishments in the C&D industry in 2000, as reported by SBA.[14] These data indicate that a majority of firms operate a single establishment and have fewer than 20 employees. Of the 214,651 C&D firms tallied by SBA for 2000, approximately 99 percent operate only one establishment, and 93 percent have fewer than 20 employees; less than 1 percent of firms have more than 500 employees. In 2000, there were 38,304 firms in heavy construction, which operated 39,516 establishments. Almost 97

[12] The SBA data, for example, provide estimates of the number of establishments operated by C&D firms. These establishment counts, however, do not match those reported in the Census of Construction. This inconsistency is partially due to differences in coverage (the SBA data include administrative establishments while the Census of Construction does not) as well as differences in data collection methods.

[13] For clarification, an *establishment* is defined as “a relatively permanent office or other place of business where the usual business activities related to construction are conducted” (U.S. Census Bureau, 2000). A *firm* refers to the aggregation of all establishments owned by one company; one firm, therefore, could consist of several establishments.

[14] "The data excludes non-employer businesses, thus excluding many self-employed individuals (employment is measured in March, so firms starting after March, firms closing before March, and seasonal firms can have zero employment)." SBA Office of Advocacy Website, <http://www.sba.gov/advo/stats/data.html>.

percent of the heavy construction firms operate a single establishment, and approximately 78 percent of these firms have fewer than 20 employees.

Table 2-10. Firms and Establishments by Employment Size and NAICS Codes, 2000–(SBA Data)

Description	NAICS	Firms					Establishments				
		Total	0	<20	<500	500+	Total	0	<20	<500	500+
Building, developing, and general contracting	*233*	*214,651*	*33,472*	*200,611*	*214,250*	*401*	*216,354*	*33,474*	*200,662*	*214,785*	*1,569*
Land subdivision and land development	23310	12,902	2,982	12,127	12,811	91	13,111	2,984	12,141	12,884	227
Single-family housing construction	23321	150,685	24,403	145,864	150,594	91	151,296	24,403	145,880	150,770	526
Multifamily housing construction	23322	8,208	1,312	7,518	8,177	31	8,254	1,312	7,518	8,191	63
Manufacturing and industrial building construction	23331	6,984	723	5,561	6,920	64	7,039	723	5,562	6,934	105
Commercial and institutional building construction	23332	36,022	4,052	29,549	35,815	207	36,654	4,052	29,561	36,006	648
Heavy construction	*234*	*38,304*	*4,243*	*29,702*	*38,008*	*296*	*39,516*	*4,246*	*29,724*	*38,320*	*1,196*
Highway and street construction	23411	10,434	1,267	7,631	10,339	95	10,889	1,267	7,637	10,440	449
Bridge and tunnel construction	23412	872	58	480	846	26	906	58	481	861	45
Water, sewer, and pipeline construction	23491	7,390	578	5,316	7,344	46	7,483	579	5,319	7,371	112
Power and communication transmission line construction	23492	3,411	469	2,630	3,364	47	3,644	470	2,632	3,389	255
Industrial nonbuilding structure construction	23493	631	51	407	568	63	689	51	407	574	115
All other heavy construction	23499	15,702	1,820	13,239	15,594	108	15,905	1,821	13,248	15,685	220
Excavation contractors	*23593*	*26,980*	*4,966*	*25,570*	*26,967*	*13*	*27,005*	*4,966*	*25,570*	*26,982*	*23*
Wrecking and demolition contractors	*23594*	*1,733*	*375*	*1,447*	*1,727*	*6*	*1,752*	*375*	*1,447*	*1,733*	*19*

Source: U.S. SBA (2000), based on data provided by the U.S. Census Bureau.

2.3.2.2 Firm-Level Revenues (SBA Data)

Table 2-11 shows SBA's data on the number of employer firms and establishments, in 1997, based on NAICS industry group and revenue size class. These data also show that most firms in the C&D industry are small. Approximately three-quarters (75.2 percent) of the firms in the target industry sectors reported under $1.0 million in revenues for 1997; nearly 94 percent of firms reported revenues lower than $5.0 million.

2.3.3 Number of Small Entities

SBA uses size standards based on either number of employees or annual revenue to define small entities (13 CFR 121). For all of the C&D industry groups, the size standards are based on annual revenues. Table 2-12 presents the SBA revenue thresholds for the C&D industry, which range from $5.0 million for NAICS 23310 (land subdivision and land development) to $27.5 million for the majority of NAICS 233 (building, developing, and general contracting) and NAICS 234 (heavy construction).[15] An estimated 189,805 C&D businesses, representing 99.5 percent of all businesses in the C&D industry, fall below the SBA-defined revenue thresholds for this industry and, therefore, could qualify as small businesses under SBA definitions. Table 2-12 shows the total estimated number of businesses and total small businesses in the C&D industry; the number of potentially affected small businesses is developed in Chapter Six.

2.3.4 Entities Not Covered by the Final Action

Not all establishments and firms that fall within the industry definitions outlined in the previous sections will be affected by the Final Action. The Final Action will apply only to those establishments engaged in activities that disturb land. EPA believes that some entities will be excluded from regulatory coverage under Options 1, 2, and 4 because they are primarily engaged in remodeling activities that will

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[15] SBA has revised the small business size standards for some NAICS codes. The new size standards for construction firms have been updated to $6.0 million for NAICS 23311 (land subdivision and development) and $28.5 million for the majority of industries within NAICS 233 and 234 (U.S. SBA, 2002).

Table 2-11. Firms and Establishments with Payrolls by Revenue Size Class, 1997[a] (SBA Data)

Description	Firms							Establishments[b]						
	Total Number of Firms	< $1 Million	< $5 Million	< $7.5 Million	< $25 Million	< $100 Million	More than $100 Million	Total Establish-ments	< $1 Million	< $5 Million	< $7.5 Million	< $25 Million	< $100 Million	More than $100 Million
Land subdivision and Development	11,036	7,744	10,207	10,501	10,851	10,948	88	11,205	7,746	10,218	10,514	10,896	11,018	186
Single-family housing Construction	149,130	123,414	145,305	146,917	148,634	148,975	155	149,823	123,420	145,339	146,962	148,736	149,161	661
Multifamily housing Construction	6,911	5,128	6,347	6,518	6,791	6,877	34	7,009	5,129	6,354	6,527	6,810	6,910	99
Manufacturing and industrial building construction	7,950	4,674	6,841	7,156	7,692	7,879	71	8,075	4,675	6,847	7,166	7,713	7,914	160
Commercial and institutional building construction	38,195	22,518	32,523	34,085	36,964	37,882	313	39,044	22,526	32,560	34,133	37,075	38,124	920
Highway and street construction	10,778	5,683	8,681	9,291	10,320	10,679	99	11,117	5,683	8,689	9,302	10,349	10,758	359
Bridge and tunnel construction	875	287	583	638	788	847	28	915	288	584	640	795	859	56
Water, sewer, and pipeline construction	7,916	4,475	6,861	7,245	7,768	7,883	33	8,075	4,476	6,864	7,251	7,791	7,938	137
Power and communication transmission line construction	2,781	1,572	2,411	2,546	2,729	2,770	11	2,837	1,572	2,412	2,548	2,738	2,789	48
Industrial nonbuilding structure construction	3,941	2,786	3,612	3,713	3,860	3,909	32	4,023	2,787	3,617	3,720	3,874	3,936	86
All other heavy construction	12,973	9,110	11,873	12,213	12,697	12,863	111	13,594	9,118	11,920	12,279	12,814	13,087	507
Excavation contractors	22,046	19,093	21,659	21,820	22,002	22,038	8	22,072	19,093	21,661	21,823	22,005	22,055	17
Wrecking and demolition contractors	1,270	840	1,165	1,204	1,249	1,261	9	1,285	840	1,166	1,205	1,252	1,271	14
TOTAL	**275,802**	**207,324**	**258,068**	**263,847**	**272,345**	**274,811**	**992**	**279,074**	**207,353**	**258,231**	**264,070**	**272,848**	**275,820**	**3,250**

[a] Data are for 1997. SBA does not report revenue size class data in NAICS format and will not do so until the 2002 Economic Census is published. These figures were calculated using percentages provided in the Census Bureau's NAICS to SIC bridge, which is available at <www.census.gov/epcd/ec97brdg.HTM.>

[b] The number of establishments reported here could differ from the number reported in previous tables due to the different sources used (see Table 2-2 and accompanying text for further discussion). Earlier tables are based on data from the 1997 Economic Census; Table 2-11 is based on 1997 data from SBA/Census of Construction and was converted from SIC to NAICS for the purposes of this analysis.

Source: U.S. SBA (2000)

Table 2-12. Number of Firms and Establishments Above and Below SBA Thresholds for Small Business Definition: (SBA Data)

NAICS	SBA Revenue Threshold (million $)	Total Estimated Number of Businesses	Estimated Number of Small Businesses	Small Businesses as a Percent of Total
23321: Single-family housing construction	$27.5	138,732	138,583	99.9%
23322: Multifamily housing construction	$27.5	7,534	7,491	99.4%
23331: Manufacturing and industrial building construction	$27.5	7,257	7,050	97.1%
23332: Commercial and institutional building construction	$27.5	37,220	36,681	98.6%
TOTAL	**–**	**190,743**	**189,805**	**99.5%**

Note: For those industry groups with a $27.5 million SBA cutoff, the table shows the number of firms and establishments with revenues below $25.0 million (the next closest SBA data break point). For industry groups with a $11.5 million SBA cutoff, figures shown are for firms and establishments with revenues below $7.5 million. SBA has adopted the 2002 NAICS classification and revised small business size standards. The new size standards for construction firms have been updated to $6.0 million for NAICS 23311 (land subdivision and development) and $28.5 million for the majority of industry groups within NAICS 233 and 234 (U.S. SBA, 2002). This change is not reflected in this study because since the SBA data break points remain unchanged.
Source: U.S. SBA (2000); also, see Chapter Six.

not result in land disturbance. Others will be excluded because they are, generally, not the primary NPDES permit holder. As discussed in Section IV.A in the preamble of the proposed rule, special trade contractors are typically not identified as NPDES permit holders and are therefore unlikely to be covered by the Final Action. In this section, EPA provides estimates of the number of establishments that fall into this category. The resulting estimates are brought together in Section 2.3.5 to derive final estimates of the number of establishments covered by the Final Action.

2.3.4.1 Establishments Engaged in Remodeling

Two sources provide information on the potential number of C&D establishments that are actually remodelers. In an article published in *Housing Economics*, NAHB economists estimated that, in 1997, approximately 45,952 establishments in the residential building industry were involved in *remodeling activities only* (Ahluwalia and Chapman, 2000). This count is based on analysis of census microdata on establishments, receipts, and source of receipts. Establishments were classified as remodelers in this study if they earned *100 percent* of revenues from remodeling activities.

The Joint Center recently published a report on the remodeling industry (Joint Center, 2001). This report classified establishments that derive *at least half* of their revenues from remodeling activities as remodelers. When defined in this manner, the study found that 62,400 establishments classified as general contractors/builders in 1997 were actually remodelers.

Both of these estimates pertain to establishments classified by the Census of Construction as *general contractors/builders.* The Joint Center study goes further to identify establishments classified in various special trades (e.g., carpentry and plumbing) that are primarily engaged in remodeling, but these estimates do not include establishments that are considered part of the C&D industry (i.e., NAICS 23593, excavation contractors, and 23594, wrecking and demolition contractors).[16] NAHB does not address the issue of special trades contractors in its report. Neither report addresses the number of establishments in NAICS 234 (heavy construction) that could be engaged primarily in remodeling activities; EPA, however, does not expect that establishments in the heavy construction sector would be engaged primarily in remodeling activities.

After reviewing these studies, EPA concluded that the Joint Center's estimate of the number of remodelers included in C&D industry statistics was the best. This study defines remodelers as establishments that earn at least 50 percent of their revenues from remodeling (and thus earn less than 50 percent from building activity). EPA concludes that these establishments, when engaged in building

[16] The Joint Center study does provide an estimate for the number of remodelers classified in "miscellaneous special trades" (NAICS 2359), which includes NAICS 23593, NAICS 23594, and several other industry groups. The number of remodelers classified primarily in NAICS 23593 and 23594, is not necessarily large, however, as the total number in NAICS 2359 is only 6,600.

activity, are unlikely to disturb more than 1 acre of land and would, therefore, not be covered by the Final Action.

2.3.4.2 Establishments That Are Not NPDES Permittees

In the universe of potentially affected establishments, EPA has included all establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) because such establishments engage in land disturbing activities. In reality, however, establishments in these industries generally act as subcontractors on C&D projects and are hired by developers or general contractors to perform specific tasks. EPA does not believe that such establishments generally appear as NPDES permittees or copermittees. While these establishments are included among the universe of potentially affected establishments (and appear in Table 2-13), EPA has not included them in the subsequent economic analysis chapters (e.g., Chapters Four, Five, and Six).

2.3.5 Number of Potentially Affected Entities

EPA took several steps to adjust the number of affected entities to account for regulatory coverage and data availability. Previous sections estimated that the total number of establishments in the C&D industry is 261,617 (see Table 2-4). Subtracting the 62,400 remodeling establishments estimated in Section 2.3.4.1 from this figure yields a *potentially affected* universe of 199,217 establishments. EPA allocated the 62,400 residential remodeling establishments between the single-family and multifamily building construction industry groups (NAICS 23321 and NAICS 23322), based on their respective share of all residential building establishments.

In preparing its economic impact analysis, EPA concluded that data limitations on land developers (NAICS 2331) would preclude retaining them as a separate industry group for purposes of regulatory analysis.[17] Rather than excluding establishments in this industry group (which would cause EPA to potentially underestimate the number of affected entities and associated impacts), EPA distributed

[17] Specifically, EPA could not obtain equivalent financial data with which to build financial models of the land development industry.

them among the four building construction industry groups (single-family, multifamily, commercial, and industrial construction), based on each industry group's share of total establishments.[18]

Table 2-13 reflects this allocation, which was completed after removing establishments primarily engaged in remodeling.

EPA has further adjusted the population of affected establishments to account for differences in regulatory coverage. As described in Chapter Three, the Final Action considers three erosion and sediment control (ESC) options. Option 1 applies to sites that disturb 1 acre or more of land, while Options 2 and 4 apply to operations that disturb 5 acres or more of land at a site. Option 3 is the no-rule option, meaning that no sites or establishments would be affected.

EPA used data from the Census Bureau and other sources to define an average housing density for the nation as a whole (average number of housing units per acre), then used this figure to identify classes of establishments that would be excluded based on their likelihood of disturbing less than 1 acre (Option 1) or 5 acres (Options 2 and 4) on a project basis. EPA believes that these estimates (of establishments unaffected by the Final Action) are conservative. First, while the regulatory threshold applies to each *site*, EPA excluded establishments if the estimated number of acres disturbed *in a year* was below the regulatory threshold. In addition, the analysis was not adjusted for the percentage of site area normally left undisturbed.[19]

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[18] EPA provides further justification for and details about this step in Chapter Four.

[19] An establishment that completes 15 houses per year, for example, is estimated to account for 5.6 acres of converted land, based on the average housing density of 2.67 new single-family housing units per acre. EPA would include this establishment among those covered under Option 2, although the actual area disturbed could be less than 5 acres after factoring in open space, buffers, and other "undisturbed" areas. Furthermore, as noted, EPA assumes that all of the housing units are covered by a single NPDES permit, while in reality the establishment could operate on several sites, none of which exceeds the 5-acre threshold.

Table 2-13. Number of Potentially Affected and In-scope Establishments in the C&D Industry

NAICS	Description	Total Number of Establishments	Total Number of Establishments with Removal of 62,400 Remodelers	Allocation of NAICS 2331 to NAICS 233	Option 1		Options 2 and 4	
					<1 Acre Exclusion[b]	Excluding Special Trades	<5 Acre Exclusion[c]	Excluding Special Trades
233210	Single-family housing construction	138,849	79,664	84,731	34,070	34,070	21,362	21,362
233220	Multifamily housing construction	7,543	4,328	4,603	4,603	4,603	2,699	2,699
233320	Commercial and institutional building construction	37,430	37,430	39,810	39,810	39,810	39,810	39,810
233310	Manufacturing and industrial building construction	7,279	7,279	7,742	7,742	7,742	7,742	7,742
Total NAICS 233, except 2331		191,104	128,701	136,886	86,225	86,225	71,613	71,613
2331	Land subdivision and development	8,185	8,185	--	--	--	--	--
234	Heavy construction	42,557	42,557	42,557	42,557	42,557	42,557	42,557
235[a]	Special trade contractors	19,771	19,771	19,771	19,771	--	19,771	--
Total		**261,617**	**199,217**	**199,217**	**148,553**	**128,782**	**133,941**	**114,170**

[a] Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
[b] Excludes 50,661 firms constructing single-family homes.
[c] Excludes 12,708 firms constructing single-family homes and 1,904 firms constructing multifamily housing.
Note: Numbers do not necessarily add to totals due to rounding.
Source: U.S. Census Bureau (2000).

Based on this analysis, EPA assumed that establishments in the single-family building construction industry (NAICS 2331) that complete between one and four housing units each year are excluded under Option 1. Under Option 2, EPA also assumed that establishments in the single-family building construction industry (NAICS 2331) that complete between five and nine housing units and establishments in the multifamily building construction industry (NAICS 2332) that complete between two and nine housing units each year, are excluded. Although comments were received on this assumption, EPA believes it is justified in making this adjustment (see Chapter One and the Response to Comments Document [U.S. EPA 2004]). Chapter Four contains further detail on the data sources and method used to make this adjustment.

Table 2-13 summarizes the steps followed to make the adjustment, from the 261,617 establishments reported in Table 2-4 to the distribution of establishments potentially affected under Options 1, 2, and 4. It shows the removal of remodelers, the redistribution of land developers (NAICS 2331), and the removal of small builders considered exempt under the site size exclusions of each option. It also shows the removal of the special trades industry groups under each option. As discussed in Section XII of the Preamble of the proposed rule, special trade contractors are not included in Chapter Five (Economic Impact Analysis Results) of this report. Special trade contractors are typically subcontractors and generally are not NPDES permittees. These contractors, therefore, will not be directly affected by any of the options considered, regardless of EPA’s choice. Due to limited data, the number of establishments in NAICS 234 (heavy construction) affected under each option could not be refined further, so no adjustments were made to these establishment counts.

2.4 INDUSTRY DYNAMICS

For purposes of the economic analysis, EPA selected 1997 as the baseline year for constructing financial models. In part this reflects the availability of data from the 1997 Census of Construction, but in addition, EPA believes 1997 to be a reasonably representative year for the affected industry group. Costs, however, reflect year 2000 dollars (see Chapter Four). Before reaching the conclusion to use 1997 financial data, EPA examined historical activity data for the construction industry, reviewed analyses ofrecent trends, and looked at projections for the future. As a result of this review, EPA concluded the following:

- Historically, construction activity has been highly cyclical. Data from 1959 through 2002 for new housing units authorized by building permit show an overall growth trend that is punctuated by cyclical swings (see Figure 2-3). Highs were reached in 1972, 1978, and 1986 and lows were reached in 1974, 1982, and 1991.

- Since 1991, the industry has been on a fairly continuous growth trend. Single-family housing, for example, grew from an annual level of 0.7 million new units in 1991 to 1.3 million new units in 2002, which represents an average annual growth rate of 6.8 percent. During this same period, real GDP grew by an average of 3.8 percent per year (BEA, 2003).

- Structural changes in the market have made construction less cyclical than before. In a recent analysis, the NAHB identified several factors that contributed to the reduction in cyclicality of housing market activity. These factors include the easing of rules on credit availability, the subsequent development of adjustable-rate mortgage instruments, and the maturation of the secondary market for mortgage-backed securities (NAHB, no date).

- The Next Decade for Housing, an NAHB report, predicts that between 2001 and 2010 the nation will build an average of 1.82 million new homes per year, up from an average of 1.66 million per year between 1991 and 2000 (see Table 2-14).

- A surprising feature of the most recent economic slowdown is that it has not significantly affected construction activity, particularly, new home construction. As NAHB's chief economist wrote in early 2002, "Believe it or not, 2001 turned out to be a record year for sales of both new and existing homes, despite three quarters of economic recession and the shock of the terrorist attacks" (Seiders, 2002).

Based on this review, EPA concluded that financial data from the year 1997 provide a reasonable basis for characterizing the industry groups likely to be affected by the Final Action. In particular, EPA concluded that there is nothing to suggest that 1997 represents a particularly robust year.

2.5 INTERNATIONAL COMPETITIVENESS

Construction activities are highly localized, with most activities being performed either in the state of the establishment or in neighboring states. Some of the largest builders could perform work nationwide. The Census of Construction includes only construction activities within the United States; it does not mention construction work that U.S. establishments conducted outside the U.S. (U.S. Census Bureau, 2000). EPA concludes that U.S. construction firms conduct a negligible amount of work outside of the United States.

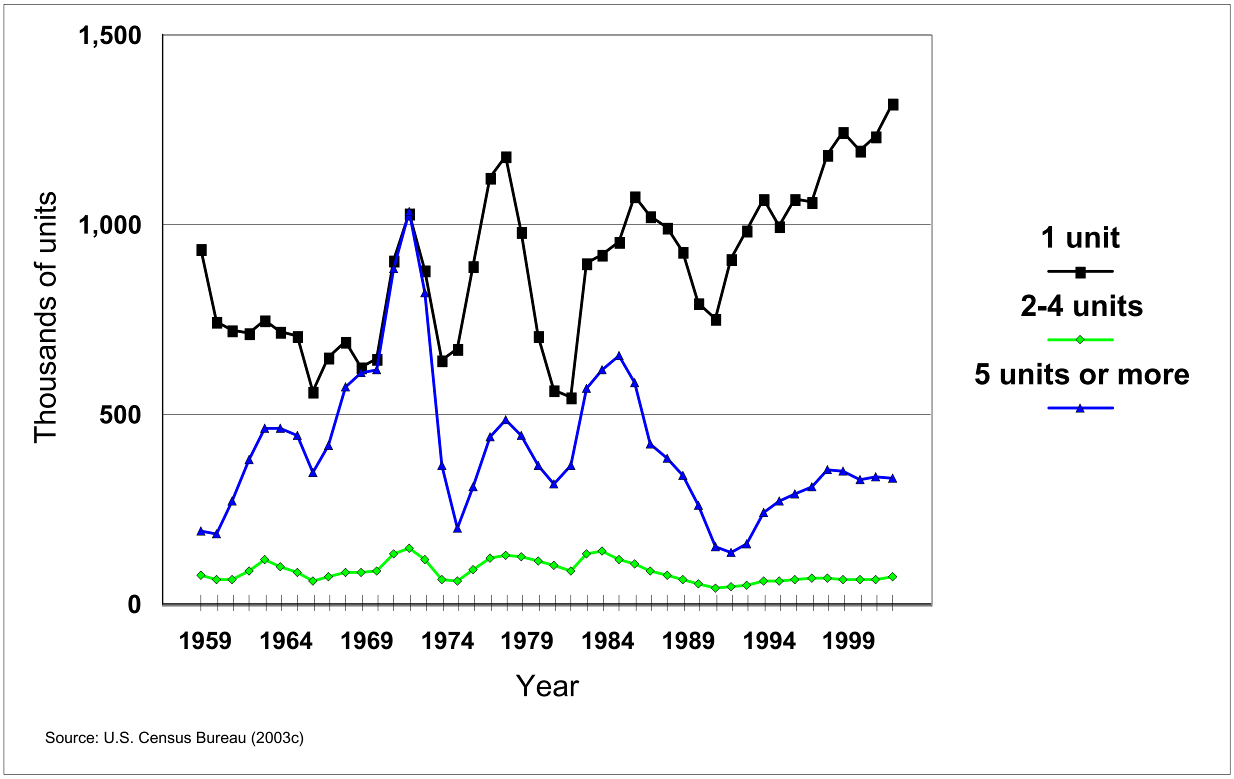

Figure 2-3. New Privately Owned Housing Units Authorized by Building Permits in Permit-Issuing Places: Annual Data

Table 2-14. Housing Supply and Demand - Historical Data and Projections for 2001-2010 (average per year in thousands)

	1971-1980	**1981-1990**	**1991-2000**	**2001-2010 Projection**
Change in households	1,578	1,281	1,137	1,255
Change in vacancies	151	219	184	223
Net removals	333	214	343	344
TOTAL DEMAND	**2,062**	**1,714**	**1,664**	**1,822**
New single-family	1,110	979	1,108	1,203
New multifamily	602	491	257	343
Mobile homes	349	244	298	276
TOTAL SUPPLY	**2,062**	**1,714**	**1,664**	**1,822**

Source: NAHB (no date); based on U.S. Census Bureau data and NAHB forecasts.

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Appendix 2a. Crosswalk between 1997 NAICS and 2002 NAICS structures

2002 NAICS Code	Description	Relevant 1997 NAICS codes
236	**Construction of buildings**	
2361	Residential building construction	
23611	Residential building construction	
236115	New single-family housing construction (except operative builders)	233210 Single-family housing construction (except operative builders and remodeling contractors)
236116	New multifamily housing construction (except operative builders)	233220 Multifamily housing construction (except barrack and dormitory construction, operative builders, and remodeling contractors)
236117	New housing operative builders	233210 Single-family housing construction (operative builders) 233220 Multifamily housing construction (operative builders)
236118	Residential remodelers	233210 Single-family housing construction (remodeling contractors) 233220 Multifamily housing construction (remodeling contractors)
2362	Nonresidential building construction	
236210	Industrial building construction	233310 Manufacturing and industrial building construction (except grain elevators, dry cleaning plants, and manufacturing and industrial warehouses) 234930 Industrial nonbuilding structure construction (process batch plants, incinerators, industrial furnaces and kilns, mining appurtenance, and construction management of these projects) 234990 All other heavy construction (waste disposal plant construction)
236220	Commercial and institutional building construction	233220 Multifamily housing construction (barrack and dormitory construction) 233310 Manufacturing and industrial building construction (grain elevators, dry cleaning plants, and manufacturing and industrial warehouses) 233320 Commercial and institutional building construction 235990 All other special trade contractors (indoor swimming pools)
237	**Heavy and civil engineering construction**	
2371	Utility system construction	
237110	Water and sewer line and related structures construction	234910 Water, sewer, and pipeline construction (water/sewer pumping stations, sewage collection and disposal lines, storm sewers, sewer/water mains and lines, water storage tanks and towers, and construction management of these projects) 234990 All other heavy construction (irrigation systems, sewage treatment and water treatment plants, construction management of these projects) 235810 Water well drilling contractors

Appendix 2a. Crosswalk between 1997 NAICS and 2002 NAICS structures

2002 NAICS Code	Description	Relevant 1997 NAICS codes
237120	Oil and gas pipeline and related structures construction	213112 Support activities for oil and gas operations (construction of field gathering lines on a contract basis) 234910 Water, sewer, and pipeline construction (gas and oil pumping stations, gas and oil pipeline construction, gas mains, gas and oil storage tank construction, and construction management of these projects) 234930 Industrial nonbuilding structure construction (petrochemical plants, refineries, and construction management of these projects)
237130	Power and communication line and related structures construction	234920 Power and communication transmission line construction 234930 Industrial nonbuilding structure construction (power generation plants (excluding hydroelectric dams), transmission and distribution transformer stations, and construction management of these projects)
2372	Land subdivision	
237210	Land subdivision	233110 Land subdivision and land development
2373	Highway, street, and bridge construction	
237310	Highway, street, and bridge construction	234110 Highway and street construction 234120 Bridge and tunnel construction (bridge construction) 235210 Painting and wall covering contractors (highway and traffic line painting)
2379	Other heavy and civil engineering construction	
237990	Other heavy and civil engineering construction	234120 Bridge and tunnel construction (tunnel construction) 234990 All other heavy construction (except waste disposal plant construction, irrigation systems, sewage treatment and water treatment plants, right-of-way cleaning and line slashing, blasting, trenching, and equipment rental with operator) 235990 All other special trade contractors (anchored earth retention contractors)
238	**Special trade contractors**	
2389	Other specialty trade contractors	
238910	Site preparation contractors	213112 Support activities for oil and gas operations 213113 Support activities for coal mining 213114 Support activities for metal mining 213115 Support activities for nonmetallic minerals (except fuels) 234990 All other heavy construction (right-of-way cleaning and line slashing, blasting, trenching, and equipment rental (except cranes) with operator) 235110 Plumbing, heating, and air-conditioning contractors (septic tank, cesspool, and dry well construction contractors) 235930 Excavation contractors 235940 Wrecking and demolition contractors 235990 All other special trade contractors (dewatering contractors, core drilling for construction, and test drilling for construction)

Source: U.S. Census Bureau (2003b).